



NOTICE OF ALLOWANCE AND FEE(S) DUE

22801 7590 05/01/2008

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SPOKANE, WA 99201

EXAMINER

LE, JESSICA N

ART UNIT PAPER NUMBER

2161

DATE MAILED: 05/01/2008

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.

10/825,894 04/15/2004 Hua-Jun Zeng MS1-1890US 8978

TITLE OF INVENTION: TERM SUGGESTION FOR MULTI-SENSE QUERY

Table with 7 columns: APPLN. TYPE, SMALL ENTITY, ISSUE FEE DUE, PUBLICATION FEE DUE, PREV. PAID ISSUE FEE, TOTAL FEE(S) DUE, DATE DUE

nonprovisional NO \$1440 \$300 \$0 \$1740 08/01/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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22801 7590 05/01/2008

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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

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| (Depositor's name) |
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/825,894 | 04/15/2004 | Hua-Jun Zeng | MS1-1890US | 8978 |

TITLE OF INVENTION: TERM SUGGESTION FOR MULTI-SENSE QUERY

| APPLN. TYPE | SMALL ENTITY | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|----------------|--------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | NO | \$1440 | \$300 | \$0 | \$1740 | 08/01/2008 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---------------|----------|----------------|
| LE, JESSICA N | 2161 | 707-003000 |

| | |
|---|---|
| <p>1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).</p> <p><input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.</p> <p><input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.</p> | <p>2. For printing on the patent front page, list</p> <p>(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____</p> <p>(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____</p> <p>3 _____</p> |
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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE _____ (B) RESIDENCE: (CITY AND STATE OR COUNTRY) _____

Please check the appropriate assignee category or categories (will not be printed on the patent) : Individual Corporation or other private group entity Government

| | |
|---|--|
| <p>4a. The following fee(s) are submitted:</p> <p><input type="checkbox"/> Issue Fee</p> <p><input type="checkbox"/> Publication Fee (No small entity discount permitted)</p> <p><input type="checkbox"/> Advance Order - # of Copies _____</p> | <p>4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)</p> <p><input type="checkbox"/> A check is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).</p> |
|---|--|

5. Change in Entity Status (from status indicated above)

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO. Includes application details for 10/825,894 and 22801, inventor Hua-Jun Zeng, attorney LEE & HAYES PLLC, examiner LE, JESSICA N, and date mailed 05/01/2008.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 424 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 424 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

| | | |
|------------------------|---------------------|--|
| Application No. | Applicant(s) | |
| 10/825,894 | ZENG ET AL. | |
| Examiner | Art Unit | |
| JESSICA N. LE | 2161 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

- 1. This communication is responsive to Amendment After Final filed 02/28/2008.
- 2. The allowed claim(s) is/are 1, 3, 5-15, 17, 19-29, 31, 33-43, 45-50 (Re-numbered as 1-43).
- 3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some* c) None of the:
 - 1. Certified copies of the priority documents have been received.
 - 2. Certified copies of the priority documents have been received in Application No. _____.
 - 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

- 4. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 - 5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
- 6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- 1. Notice of References Cited (PTO-892)
- 2. Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 04/17/2008
- 4. Examiner's Comment Regarding Requirement for Deposit of Biological Material
- 5. Notice of Informal Patent Application
- 6. Interview Summary (PTO-413), Paper No./Mail Date _____.
- 7. Examiner's Amendment/Comment
- 8. Examiner's Statement of Reasons for Allowance
- 9. Other _____.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Applicant's Representative, Ms. Beatrice L. Koempel-Thomas, on April 16th, 2008, on April 18th, 2008, and on April 24th, 2008.

The application has been amended as follows:

In the Claims...

- **Claims 1, 5, 9, 13-15, 19, 23, 27-29, 33, 37, 41-43, 46, 48-50 have been amended as follows:**

1. (Currently Amended) A computer-implemented method for related term suggestion, the method comprising:

mining search results via a multi-sense query, wherein the multi-sense query comprises:

determining terms/phrases semantically related to submitted terms/phrases, wherein semantic relationships are discovered by mining a context of the terms/phrases to determine meaning;

configuring a threshold frequency of occurrence (FOO) value;

assigning historical queries to high FOO or low FOO based on the configured threshold value;

generating term vectors from the search results associated with a set of high FOO historical queries previously submitted to a search engine; and

generating term clusters as a function of calculated similarity of term vectors, wherein calculated similarity, $sim(q_j, q_k)$, is determined as follows:

$$sim(q_j, q_k) = \sum_{i=1}^d w_{ij} \cdot w_{ik};$$

wherein d represents vector dimension, q represents a query, k is a dimension index, and wherein weight w for the i^{th} vector's j^{th} term is calculated as follows:

$$w_{ij} = TF_{ij} \times \log(N / DF_j); \text{ and}$$

wherein TF_{ij} represents term frequency, N is a total number of query terms, and DF_j is a number of extracted feature records that contain the i^{th} vector's j^{th} term;

responsive to receiving a term/phrase from an entity, evaluating the term/phrase via the multi-sense query in view of terms/phrases in the term clusters to identify one or

more related term suggestions, wherein the identifying is based on a combination of FOO and a confidence value; and

returning at least one suggested term list ordered by the combination of FOO and confidence value, wherein multiple suggested term lists are generated when the term/phrase matches terms in more than one term cluster.

5. (Currently Amended) The method of claim 1, further comprising:

collecting historic query from a query log; and

determining ones of the historic query terms with [[a]] the high FOO.

9. (Currently Amended) [[A]] The method as recited in claim 1, wherein generating the term clusters further comprises:

sending respective ones of the high FOO historical queries to the search engine to obtain the search results;

extracting features from at least a subset of search results corresponding to the respective ones.

producing the term vectors from the features as a function of the term and inverted document frequencies.

13. (Currently Amended) The method of claim 12, wherein making further comprises:

identifying the low FOO historical queries from historical queries mined from [[a]] the query log;

sending respective ones of at least a subset of the low FOO historical queries to the search engine to obtain search results;

extracting features from at least a subset of search results

producing the term vectors from the features as a function of the term and inverted term frequencies.

14. (Currently Amended) The method of claim 13, and further comprising after clustering:

determining that there is no match between the term/phrase and term(s)/phrase(s) from the first set of term clusters, the first set being based on the high FOO historical queries; and

responsive to the determining, identifying a match between the term/phrase and term(s)/phrase(s) from one or more of the second set of term clusters, the second set being based on the low FOO historical queries; and

responsive to identifying, generating related term suggestion(s) comprising the term(s)/phrase(s).

15. (Currently Amended) A tangible computer-readable data storage medium comprising computer-executable instructions for executing a method, the method comprising:

mining search results via a multi-sense query, wherein the multi-sense query comprises:

determining terms/phrases semantically related to submitted terms/phrases, wherein semantic relationships are discovered by mining a context of the terms/phrases to determine meaning;

configuring a threshold frequency of occurrence (FOO) value;

assigning historical queries to high FOO or low FOO based on the configured threshold value;

generating term vectors from the search results associated with a set of high FOO historical queries previously submitted to a search engine; and

generating term clusters as a function of calculated similarity of term vectors, wherein calculated similarity, $sim(q_j, q_k)$, is determined as follows:

$$sim(q_j, q_k) = \sum_{i=1}^d w_{ij} \cdot w_{ik};$$

wherein d represents vector dimension, q represents a query, k is a dimension index, and wherein weight w for the i^{th} vector's j^{th} term is calculated as follows:

$$w_{ij} = TF_{ij} \times \log(N / DF_j); \text{ and}$$

wherein TF_{ij} represents term frequency, N is a total number of query terms, and DF_j is a number of extracted feature records that contain the i^{th} vector's j^{th} term;

responsive to receiving a term/phrase from an entity, evaluating the term/phrase via the multi-sense query in view of terms/phrases in the term clusters to identify one or

more related term suggestions, wherein the identifying is based on a combination of FOO and a confidence value; and

returning at least one suggested term list ordered by the combination of FOO and confidence value, wherein multiple suggested term lists are generated when the term/phrase matches terms in more than one term cluster.

19. (Currently Amended) The computer-readable data storage medium of claim 15, wherein the method further comprises:

collecting historic query from a query log; and

determining ones of the historic query terms with [[a]] the high FOO.

23. (Currently Amended) computer-readable data storage medium of claim 15, wherein generating the term clusters further comprises:

sending respective ones of the high FOO historical queries to the search engine to obtain the search results;

extracting features from at least a subset of search results corresponding to the respective ones.

producing the term vectors from the features as a function of the term and inverted document frequencies.

27. (Currently Amended) The computer-readable data storage medium of claim 26, wherein making a second set of term clusters comprises:

identifying the low FOO historical queries from historical queries mined from [[a]]
the query log;

sending respective ones of at least a subset of the low FOO historical queries to
the search engine to obtain search results;

extracting features from at least a subset of search results

producing the term vectors from the features as a function of the term and
inverted term frequencies.

28. (Currently Amended) The computer-readable data storage medium of claim 27,
wherein the method further comprising:

after clustering:

determining that there is no match between the term/phrase and
term(s)/phrase(s) from the first set of term clusters, the first set being based on the high
FOO historical queries; and

responsive to the determining, identifying a match between the term/phrase and
term(s)/phrase(s) from one or more of the second set of term clusters, the second set
being based on the low FOO historical queries; and

responsive to identifying, generating related term suggestion(s) comprising the
term(s)/phrase(s).

29. (Currently Amended) A computing device comprising:

a processor; and

a memory couple to the processor, the memory comprising computer-program instructions executable by the processor for:

mining search results via a multi-sense query, wherein the multi-sense query comprises:

determining terms/phrases semantically related to submitted terms/phrases, wherein semantic relationships are discovered by mining a context of the terms/phrases to determine meaning;

configuring a threshold frequency of occurrence (FOO) value;

assigning historical queries to high FOO or low FOO based on the configured threshold value;

generating term vectors from the search results associated with a set of high FOO historical queries previously submitted to a search engine; and

generating term clusters as a function of calculated similarity of term vectors, wherein calculated similarity, $sim(q_j, q_k)$, is determined as follows:

$$sim(q_j, q_k) = \sum_{i=1}^d w_i \cdot w_k ;$$

wherein d represents vector dimension, q represents a query, k is a dimension index, and wherein weight w for the i^{th} vector's j^{th} term is calculated as follows:

$$w_{ij} = TF_{ij} \times \log(N / DF_{ij}); \text{ and}$$

wherein TF_{ij} represents term frequency, N is a total number of query terms, and DF_j is a number of extracted feature records that contain the i^{th} vector's j^{th} term;

responsive to receiving a term/phrase from an entity, evaluating the term/phrase via the multi-sense query in view of terms/phrases in the term clusters to identify one or more related term suggestions, wherein the identifying is based on a combination of FOO and a confidence value; and

returning at least one suggested term list ordered by the combination of FOO and confidence value, wherein multiple suggested term lists are generated when the term/phrase matches terms in more than one term cluster.

33. (Currently Amended) The computer device of claim 29, further comprising computer-program instructions executable by the processor for:

collecting historic query from a query log; and

determining ones of the historic query terms with [[a]] the high FOO.

37. (Currently Amended) The method of claim 29, wherein generating the term clusters further comprises computer-program instructions executable by the processor for:

sending respective ones of the high FOO historical queries to the search engine to obtain the search results;

extracting features from at least a subset of search results corresponding to the respective ones.

producing the term vectors from the features as a function of the term and inverted document frequencies.

41. (Currently Amended) The method of claim 40, wherein making a second set of term clusters comprises computer-executable instructions for:

identifying the low FOO historical queries from historical queries mined from [[a]] the query log;

sending respective ones of at least a subset of the low FOO historical queries to the search engine to obtain search results;

extracting features from at least a subset of search results

producing the term vectors from the features as a function of the term and inverted term frequencies.

42. (Currently Amended) The computing device of claim 41, and further comprising computer-program instructions executable by the processor after clustering, for:

determining that there is no match between the term/phrase and term(s)/phrase(s) from the first set of term clusters, the first set being based on the high FOO historical queries; and

responsive to the determining, identifying a match between the term/phrase and term(s)/phrase(s) from one or more of the second set of term clusters, the second set being based on the low FOO historical queries; and

responsive to identifying, generating related term suggestion(s) comprising the term(s)/phrase(s).

43. (Currently Amended) A computing device comprising at least one processor, the device further comprising:

means for mining search results via a multi-sense query, wherein the multi-sense query comprises:

means for determining terms/phrases semantically related to submitted terms/phrases, wherein semantic relationships are discovered by mining a context of the terms/phrases to determine meaning;

means for configuring a threshold frequency of occurrence (FOO) value;

means for assigning historical queries to high FOO or low FOO based on the configured threshold value;

means for generating term vectors from the search results associated with a set of high FOO historical queries previously submitted to a search engine; and

means for generating term clusters as a function of calculated similarity of term vectors, wherein calculated similarity, $sim(q_j, q_k)$, is determined as follows:

$$sim(q_j, q_k) = \sum_{i=1}^d w_i \cdot w_k ;$$

wherein d represents vector dimension, q represents a query, k is a dimension index, and wherein weight w for the i^{th} vector's j^{th} term is calculated as follows:

$$w_{ij} = TF_{ij} \times \log(N / DF_j); \text{ and}$$

wherein TF_{ij} represents term frequency, N is a total number of query terms, and DF_j is a number of extracted feature records that contain the i^{th} vector's j^{th} term;

responsive to receiving a term/phrase from an entity, means for evaluating the term/phrase via the multi-sense query in view of terms/phrases in the term clusters to identify one or more related term suggestions, wherein the identifying is based on a combination of FOO and a confidence value; and

means for returning at least one suggested term list ordered by the combination of FOO and confidence value, wherein multiple suggested term lists are generated when the term/phrase matches terms in more than one term cluster.

46. (Currently Amended) The computing device of claim 43, further comprising computer-program instructions executable by the processor for:

collecting means to collect historic query terms from a query log; and

determining means to determine ones of the historic query terms with [[a]] the high FOO.

48. (Currently Amended) The computing device of claim 43, wherein the generating means to generate the term clusters further comprise:

sending means to send respective ones of the high FOO historical queries to the search engine to obtain the search results;

extracting means to extract features from at least a subset of search results corresponding to the respective ones.

producing means to produce the term vectors from the features.

49. (Currently Amended) [[A]] The computing device as recited in claim 43, wherein the term clusters are a first set of term clusters, and wherein the computing device further comprises:

determining means to determine that there is no match between the term/phrase and the terms/phrases; and

responsive to the determining:

making means to make a second set of term clusters from calculated similarity of term vectors, each term vector being generated from search results associated with a set of low FOO historical queries previously submitted to the search engine; and

evaluating means to evaluate the term/phrase in view of terms/phrases of the second set of term clusters to identify one or more related term suggestions.

50. (Previously presented) The computing device of claim 49, and further comprising:

calculating means to calculate that there is no match between the term/phrase and term(s)/phrase(s) from the first set of term clusters, the first set being based on the high FOO historical queries; and

responsive to the calculating, identifying means to identify a match between the term/phrase and term(s)/phrase(s) from one or more of the second set of term clusters, the second set being based on the low FOO historical queries; and

responsive to identifying, generating means to generate related term suggestion(s) comprising the term(s)/phrase(s).

Allowable Subject Matter

2. Claims 1, 3, 5-15, 17, 19-29, 31, 33-43, 45-50 are allowed (*Re-numbered as 1-43*).

3. The following is an examiner's statement of reasons for allowance:

Regarding to independent claim 1, Applicant's argument filed 02/28/2008 has been fully considered and are persuasive. Prior art does not appear to teach or make obvious the combination of the claimed elements recited in steps of claim 1, as including: "*generating term clusters as a function of calculated similarity of term vectors, wherein calculated similarity, $sim(q_j, q_k)$, is determined as follows:*

$$sim(q_j, q_k) = \sum_{i=1}^d w_{ij} \cdot w_{ik};$$

wherein d represents vector dimension, q represents a query, k is a dimension index, and wherein weight w for the i^{th} vector's j^{th} term is calculated as follows:

$$w_{ij} = TF_{ij} \times \log(N / DF_j); \text{ and}$$

wherein TF_{ij} represents term frequency, N is a total number of query terms, and DF_j is a number of extracted feature records that contain the i^{th} vector's j^{th} term". Also, Applicants had interpreted the use of the "x" in the above formula/equation represents a

"multiplication operation" (see Arguments/Remarks filed 02/05/2007, page 26). Thus, prior art of record neither renders obvious nor anticipates the combination of claimed elements in light of the specification. After a further search and a thorough examination of the present application and in light of the prior arts made of record, independent claim 1 is allowed.

Claim 15 recites "*a tangible computer-readable data storage medium*", claim 29 recites "*a computing device*" (comprising processor and memory), and claim 43 recites "*a computing device*" (comprising means for) for performing the method similar to claim 1, and therefore are allowed by the same reasons.

Dependent claims 3, 5-14, 17, 19-28, 31, 33-42, and 45-50 are also allowed at least by virtue of their dependency for claims 1, 15, 29, and 43.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica N. Le whose telephone number is (571) 270-1009. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Apu M. Mofiz can be reached on (571) 272-4080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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